



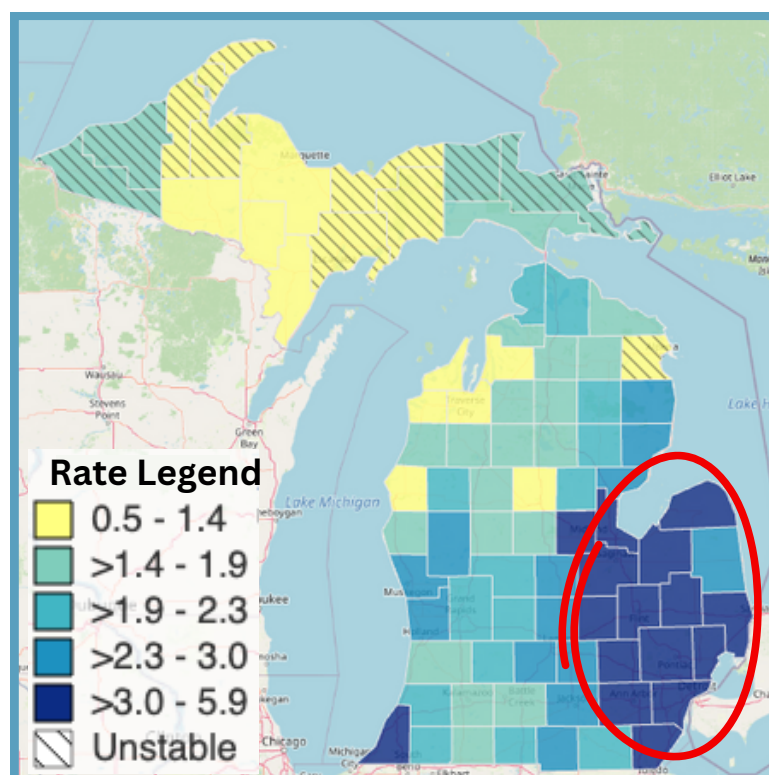
Asthma and Your Environment: Avoiding Your Triggers and Outdoor Pollution

What asthma triggers are unique in Southeast Michigan?

Most people know that asthma is a serious health problem which affects people's breathing. What you may not know is that asthma is connected to **air pollutants, like ozone and sulfur dioxide**.^{1 2} This is important for the Southeast Michigan community because it has some of the highest levels of air pollutants in the state.

The map below shows that people in Southeast Michigan are more likely to have a hospital stay due to complications of asthma.^{1 2 3}

The 2020 rate of hospital stays for asthma in Michigan*



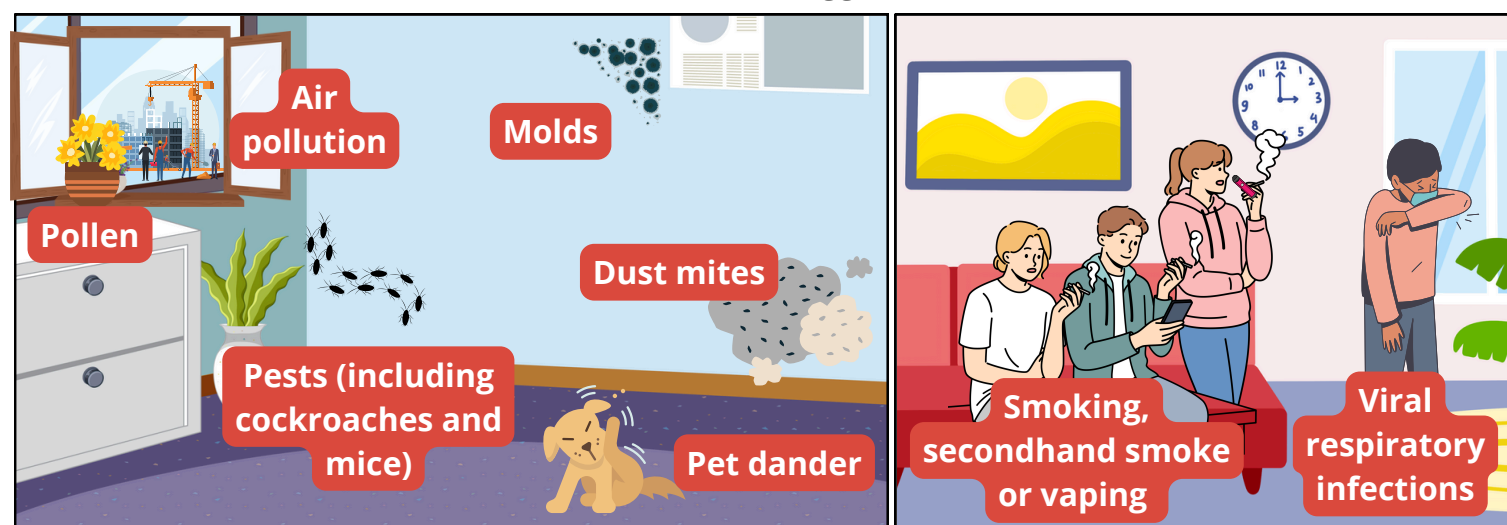
*This is an “age-adjusted rate per 10,000 people” which means it accounts for the difference of age within the populations measured.



What triggers asthma reactions or asthma attacks for people with asthma?

There are many triggers people with asthma should be aware of: ^{4 5}

Asthma triggers:



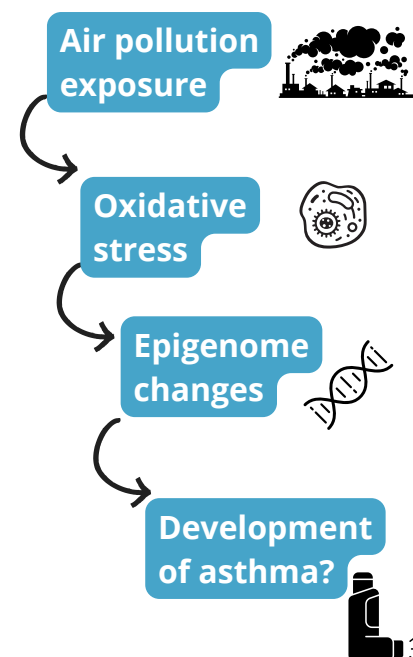
Goal: Identify what triggers your asthma and do your best to avoid those triggers.^{4 5}



What should I know about outdoor air pollution and asthma?

Research suggests a connection between being exposed to air pollution and developing asthma through the pathway suggested below. There is evidence of other ways that people can develop asthma, but this is one hypothesis:

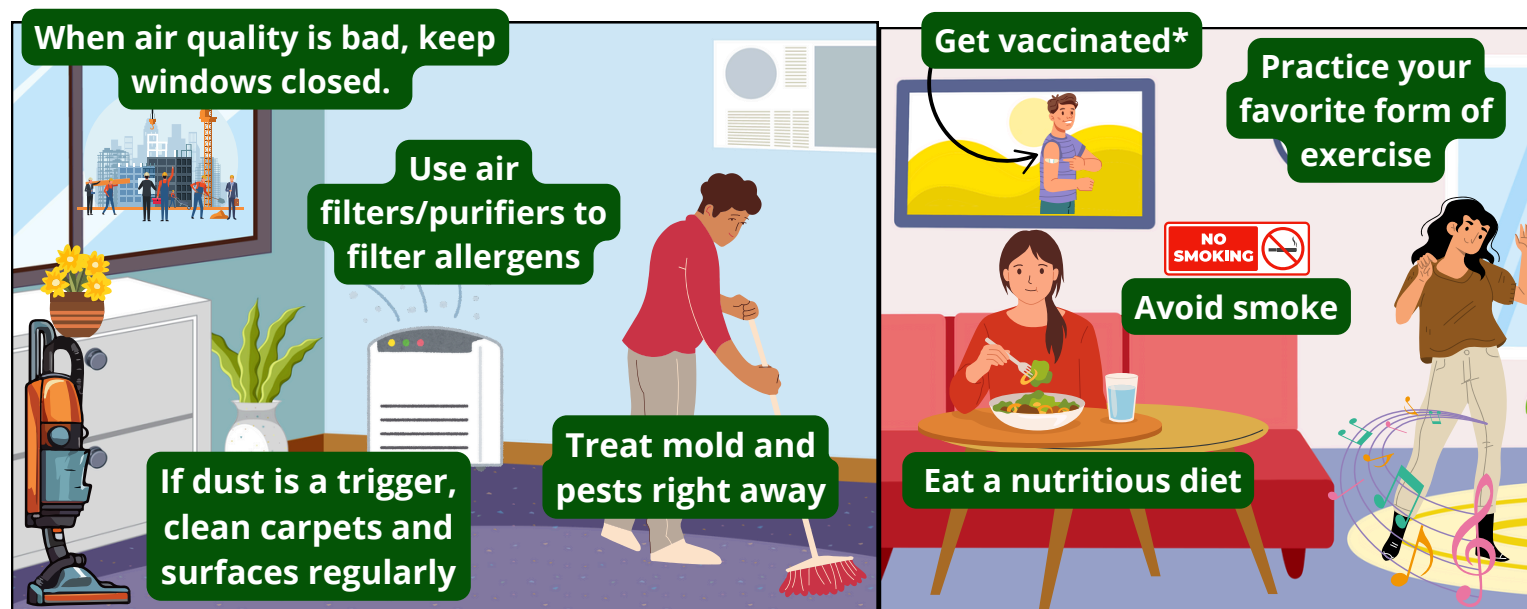
1. Air pollution can increase the number of **free radicals** (an unstable molecule that can build up) in our cells ⁶
2. These free radicals could cause **oxidative stress** (where there are too many free radicals and not enough antioxidants to remove them) in cells and stop normal cell function
 - a. Eating foods rich in antioxidants could help reduce the effects of oxidative stress and asthma symptoms. ⁷
3. Exposure to air pollutants can affect the epigenome and how “loud” some genes are. ^{8 9 10} The **epigenome** acts like a volume control for our genes, making some genes “louder” (or more expressive) than others.
4. Some epigenome changes are known to be associated with asthma and can be more common in people who have been exposed to air pollutants. ¹¹



What does this mean for me and my community?

If you live or work near higher levels of environmental air pollutants, there are individual steps you can take in your environment to improve your asthma. You can also take steps to improve asthma in your community. These actions can also reduce the chance that children will develop asthma.

Reducing my asthma triggers:



*Another note about vaccinations and viruses:

Protecting yourself against viruses is very important for people with asthma.

- Follow basic precautions such as covering your mouth and nose and washing hands.
- Consider vaccination for pneumonia, influenza, pertussis (whooping cough), RSV (for some age groups), and COVID-19.

What steps can I take to improve asthma in my community?

- Work with others to promote regulations that:
 - Decrease exposure to air pollution from cars and trucks
 - Decrease exposure to air pollution from industrial sources
- Work with others to promote access to healthy, affordable anti-oxidant rich foods
- Scan the QR code for more resources in Southeast Michigan.



Please see http://mleead.umich.edu/Coec_Fact_Sheets.php for the citations included in this factsheet. This research was supported by the National Institute of Environmental Health Sciences (NIEHS) (#R01ES022616, #R01ES032389) and the Fred A. and Barbara M. Erb Family Foundation, with additional support provided by the Michigan Center on Lifestage Environmental Exposures and Disease (M-LEEAD) (NIEHS #P30ES017885).

